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Predicting Student-Athlete and Non-Athletes' Intentions to Self-Manage Mental Health: Testing an Integrated Behaviour Change Model

Stephen Shannon[a,d,*], Gavin Breslin[a,d], Tandy Haughey[a], Nyasha Sarju[a], Drew Neill[b], Martin Lawlor[c], Gerry Leavey[d]

[a] Sport and Exercise Sciences Research Institute, Ulster University, Jordanstown Campus, Shore Road, Newtownabbey, Northern Ireland BT370QB, United Kingdom
[b] Student Support, Ulster University, Jordanstown Campus, Shore Road, Newtownabbey, Northern Ireland BT370QB, United Kingdom
[c] Health Service Executive, South Cork, Ireland.
[d] Institute of Mental Health Sciences, Ulster University, Coleraine Campus, Northern Ireland BT52 1SA, United Kingdom

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ABSTRACT

The objective of this study was to assess the factorial and predictive validity of an Integrated Behaviour Change (IBC) model (Hagger & Chatzarantis, 2014) for predicting Higher Education (HE) student-athlete and non-athletes' intentions to self-manage mental health. Students (n = 200) aged 21.10 (SD = 3.73; male = 53%; athlete = 69%) completed a questionnaire, and a two-step model building approach was conducted (i.e. confirmatory factor [CFA] and path analysis). Demographic (i.e. female or male; athlete or non-athlete) and IBC (i.e. autonomous and controlled motivation, subjective norms, perceived behavioural control and attitudes) variables were specified as predictors of students' intentions to self-manage mental health. The factorial validity of the IBC was supported through models achieving satisfactory fit indices. Further, the path model explained a significant proportion of the variance for self-management intentions (R^2 = 0.30). Autonomous (β = 0.29) and controlled (β = 0.13) motivation, alongside perceived behavioural control (β = 0.12) and gender (i.e. female; β = 0.12) predicted better self-management intentions. Autonomous motivation also positively predicted attitudes (β = 0.42), subjective norms (β = 0.32) and perceived behavioural control (β = 0.15). The promotion of autonomous motives and enhanced perceived behavioural control may offer the opportunity to facilitate effective self-management of mental health among students. Those involved in designing interventions may consider integrating the IBC for mental health promotion, tailoring interventions to gender and athlete norms.

1. Background

Mental health refers to a state of well-being, wherein each individual realises their potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to their community (World Health Organisation; WHO, 2017). Optimal emotional, social and psychological well-being is considered positive mental health (Keyes, 2005), which is associated with autonomous self-management of health, and resilience to adversity (Ryan & Deci, 2017). However, few people fall into the positive mental health category, with a significant proportion of people being diagnosed with, or at risk, of mental illness (i.e. languishing; Keyes, 2005). During a given year, an estimated 300 million individuals experience depression (WHO, 2017), and one in four report a mental health problem (McManus, Meltzer, Brugha, Bebbington, & Jenkins, 2009). Individuals are prone to mental health problems during life transitions, such as the progression through from teenage years into early adulthood (i.e. 18–25 years), which for many corresponds with their time at Higher Education (HE; i.e. university or college) (McLafferty et al., 2017).

HE students are at risk for mental health problems due to increased life stressors such as study demands, uncertain career transitions, financial concerns and living away from home (Pitt, Oprescu, Tapia, & Gray, 2017). In the United Kingdom (UK) between 17% (Macaskill, 2012) and 27% (YouGov, 2016) of students reported a mental health problem. Moreover, recent research in Northern Ireland (McLafferty et al., 2017) indicates that one fifth of students will experience depression or anxiety during a 12-month period. Females consistently report higher mental health problems than males, but also are more likely to avail of mental health services (McLafferty et al., 2017; Thorley, 2017). While scant research has examined student-

* Corresponding author at: Sport and Exercise Sciences Research Institute, Ulster University, Jordanstown Campus, Shore Road, Newtownabbey, Northern Ireland BT370QB, United Kingdom.
E-mail address: s.shannon@ulster.ac.uk (S. Shannon).

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athletes in the UK, studies in the United States indicate that student-athletes and non-athletes show similar prevalence estimates for mental health disorders (Sudano, Collins, & Miles, 2017). However, student-athletes present a higher clinical and sub-clinical risk of substance misuse, gambling, sexual risk-taking and eating disorders (Moreland, Cox & Yang, 2018; Donohue et al., 2018). Ninety four percent of universities have reported an increase in demand for counselling services (Thorley, 2017). There is a need, therefore, for student mental health interventions (Huppert, 2009).

Existing interventions for those with a mental illness, including counselling and cognitive behavioural therapy yield small-to-moderate positive effects for improving mental health (Spijkerman, Pots, & Bohlmeijer, 2016; Steinert, Munder, Rabung, Hoyer, & Leichsenring, 2017). However, the prevention (rather than cure) model can be used to empower both healthy students, and those with early or chronic mental illness symptoms, in improving their mental health-related circumstances (Huppert, 2009). Successful prevention programmes have been designed for student-athletes (Breslin et al., 2018) and non-athletes (Stanley, Hom, & Joiner, 2018). However, most programmes focus on concepts more aligned to mental health disorders, such as stigma-reduction, rather than paying attention to the management of daily life stressors, or indeed to positive mental health conceptions such as well-being. One construct that can be readily applied in interventions, and encompasses a more holistic view of mental health (Keyes, 2005), is mental health self-management (Wolf, 1996).

Applied to health broadly, self-management refers to self-monitoring how one's health is impacting upon personal functioning, emotions and interpersonal relationships and engaging with strategies that protect and promote health (Center for the Advancement of Health, 1996). Referring specifically to mental health, Wolf (2011, pg4) defines mental health self-management as empowerment with “strategies that range from improving coping with and managing the stressors of daily living, via preventing and managing milder psychiatric conditions, such as burn-out or mild depression, up to prevention of, or intervening in severe psychiatric conditions”. Whilst self-management is a relatively under researched construct in mental health (Wolf, 1996), some evidence suggests that self-management interventions may be efficacious in improving mental health outcomes (Panagioti et al., 2014). For this reason, irrespective of their current mental health state (i.e. flourishing, moderate, or mentally ill; Keyes, 2005), students may benefit from mental health self-management skills to empower them in prevention and promotion strategies.

Despite being aware of experiencing university (Chew-Graham, Rogers & Yassin, 2003) and sport-related (Gulliver, Griffiths, & Chrisenisen, 2012) stressors many student-athletes and non-athletes do not self-manage their mental health, resulting in maladaptive coping styles. For example, student-athletes are reluctant to self-manage mental health challenges, with many balancing their academic demands alongside striving for high sporting performance under stress, resulting in many presenting a positive appearance whilst hiding insecurities (Brown, Hainline, Kroshus & Wilfert, 2014; Sudano et al., 2017). Reasons for such maladaptive coping styles range from society-derived stigma perceptions, to a lack of social support, personal resources, and tailored mental health interventions (Gulliver, Christensen, & Griffiths, 2010). Theories of health behaviour have been useful in delineating the psychological and social processes underpinning mental health promotion strategies.

Health behaviour theories that are social-cognitive in origin, seek to explain how and why individuals engage in intentional health promotion or illness prevention strategies, and have been successfully applied to predict a range of health contexts (e.g. diet, physical activity, medication intake; Hagger & Chatzarantis, 2014). The Medical Research Council outline that theory-based interventions demonstrate larger effects on health than interventions not underpinned by a theory (Craig et al., 2013). Although multiple theories are available the Theory of Planned Behaviour (TPB; Ajzen, 1991) and Self-Determination Theory (SDT) (Ryan & Deci, 2017) have been applied to the mental health domain with some positive results.

The TPB specifies that an individual's perceived behavioural control (i.e. perceived personal control and external/internal facilitators), attitudes (i.e. instrumental and affective evaluation) and subjective norms (i.e. descriptive and injunctive norms) regarding a behaviour interact, which then predicts their intentions for future health behaviours (Ajzen & Fishbein, 1977; Ajzen, 1991). Intention is considered the most proximal social cognitive variable for predicting behaviour change (Ajzen, 1991) and a few studies (Bohon, Cotter, Kravitz, Cello Jr, & Fernandez y Garcia, 2016; Mo & Mak, 2009; Schomerus, Matschinger, & Angermeyer, 2009) support TPB hypotheses for attitudinal and behavioural control predictors of mental health professional help-seeking intentions. However, the motivational origins of the belief-based TPB constructs are not outlined by Ajzen (1991), which has led authors Hagger and Chatzarantis (2009a, 2014) to propose the integration of SDT.

In SDT (Ryan & Deci, 2000), motivation is hypothesised to exist along a continuum in which five distinct motivational types are considered. Intrinsic motivation, and integrated and identified regulation are proposed as autonomous forms of motivation, in which one engages in behaviours for reasons such as finding inherent satisfaction and enjoyment (i.e. intrinsic motivation), finding the behaviour is congruent within one's sense of self (i.e. integrated regulation), or for seeing the personal benefit that the behaviour brings to the individual (i.e. identified regulation). Conversely, externally motivated individuals seek approval from others when engaging with a behaviour (i.e. introjected regulation), or to avoid punishment/achieve rewards (i.e. external motivation). Thus, in the context of mental health, one could self-manage their mental health for broadly autonomous or external reasons. Indeed, systematic reviews (Teixeira et al., 2012) and meta-analyses (Ng et al., 2012) show small-to-moderate positive correlations for autonomous motivation predicting health-promotion behaviours (e.g. physical activity, diet). However, in current research the motivation regulations largely focus on behaviours relating to physical, rather than mental health (Ng et al., 2012). Therefore, the above findings cannot be extrapolated to mental health regulations, warranting a motivational analysis of mental health self-management.

Additionally, whilst SDT specifies the motivational origins of health behaviours, Ryan and Deci (2000) did not formally hypothesise the processes by which motivational orientations are converted into beliefs and intentions through their original theorising (Hagger & Chatzarantis, 2014). To overcome the predictive limitations of the TPB and SDT, Hagger and Chatzarantis (2009a; 2014) have combined SDT and TPB components within the Integrated Behaviour Change model (IBCM; Hagger & Chatzarantis, 2014). According to the IBCM model, individuals with autonomous motives towards behaviours are more likely to be motivated to perform the behaviour compared to those that hold controlled motives. As a consequence, autonomously motivated individuals will strategically align their beliefs (i.e. subjective norms, perceived behavioural control and attitudes) and intentions with their motives in order to pursue the behaviour in the future. In this view, IBCM hypotheses are consistent with SDT principles to the extent that autonomous motives are considered to be more adaptive than controlled motives with respect to forming positive cognitive representations (e.g. attitudes to engage) of future actions. Hence, intentions are the function of attitudes, subjective norms and perceived behavioural control, but autonomous and controlled motivations function as antecedents for those belief-based variables. The IBCM has received empirical support for predicting behaviours related to physical health (Hagger & Chatzarantis, 2009b), including sugar consumption (Hagger, Trost, Keech, Chan, & Hamilton, 2017), but has not yet been psychometrically tested, nor validated, for the mental health domain.

With the increasing demand on student mental health services across HE institutions (Thorley, 2017; Storrie, Ahern & Tucket, 2010; McLafferty et al., 2017), effective theory-based mental health

interventions are needed, a view shared in the Guidelines for Student Mental Health Policies and Procedures for Higher Education (UK Universities, 2015). Theoretical application is lacking in current student mental health interventions (Lo, Gupta, & Keating, 2018; Breslin et al., 2018, Donohue et al., 2018; Stanley et al., 2018), with limited knowledge of the techniques to be used in the context of designing and conducting interventions (Goodheart, Kazdin, & Sternberg, 2006). Furthermore, there are no programmes focusing on improving mental health self-management which, if promoted, may empower students with strategies ranging from managing daily stressors, through to promoting well-being and prevention of mental illness (Wolf, 1996).

Hence, theory-informed approaches are required to tailor self-management interventions for the needs of student athletes and non-athletes within university contexts. Applying the IBCM (Hagger & Chatzarantis, 2014) to the mental health domain for the first time offers a potential guide for the development of interventions. To ensure measurement and predictive validity, a two-step model-building approach (Byrne, 2001) was implemented. The aims were to, firstly, assess the factorial validity of IBCM constructs through confirmatory factor analysis (CFA), and; secondly, to predict self-management intentions though integrating IBCM constructs in a path analysis model. The findings will provide theory-informed and empirically-guided recommendations for those seeking to promote mental health through self-management approaches.

1.1. Study hypotheses

In accordance with the behavioural processes described in the IBCM (see Fig. 1 below) and extant research, autonomous and controlled motivation were, respectively, hypothesised to positively and negatively predict attitudes, subjective norms and behavioural control (Hypothesis 1; H1). Autonomous and controlled motivation were also respectively proposed to directly positively and negatively predict mental health intentions (Hypothesis 2; H2). Hypothesis 3 (H3) refers to the significant and positive relationship between attitudes, subjective norms and behavioural control linked with mental health self-management intentions. Autonomous motivation was hypothesised to indirectly predict self-management intentions through attitudes, subjective norms and behavioural control (Hypothesis 4; H4). Lastly, gender and athlete status were included as control variables (Fig. 1).

2. Materials and Methods

This study was reported using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

2.1. Study design, size, setting and participants

Ethical approval was granted from Ulster University. A cross-sectional design was conducted, with data collected at campuses. A convenience sample of undergraduate student-athletes and non-athletes was recruited via university email and personal correspondence with schools situated within the Health and Life Sciences Faculty.

2.2. Variables and measurement

2.2.1. Demographic variables

Students reported their gender (i.e. male or female), and athlete status (i.e. athlete or non-athlete) through a question consistent with the definition of sport: ‘are you an athlete involved in a structured, competitive physical activity’ (Rejeski & Brawley, 1988).

Consistent with Wolf's (1996) definition, mental health self-management was operationally defined in the questionnaire as: becoming aware of how you are feeling, and using strategies such as speaking to others or seeking professional help for your mental health, or using self-help strategies such as mindfulness, relaxation and exercising. The full questionnaire including IBCM variables is available as supplementary source.

2.2.2. Motivation to self-manage mental health

An adapted eight-item version of the validated Treatment Self-Regulation Questionnaire (TSRQ; Ryan & Connell, 1989) was used to assess Self-Determination Theory-derived (Ryan & Deci, 2000) autonomous and controlled motivation scales. Items were worded to reflect one's motivation to self-manage their mental health. Items began with the stem: ‘The reason I would manage my mental is’, and were scored on a 7-point likert scale ranging from ‘not at all true’ to ‘very true’. Four items reflected autonomous motivation (e.g. ‘because managing my mental health is an important choice I want to make’) and four items reflected controlled motivation (e.g. because I want others to see I can manage my mental health’). The Cronbach's alpha values within the sample were 0.85 (autonomous) and 0.70 (controlled).

2.2.3. Attitudes, norms, perceived behavioural control and intentions

Theory of Planned Behaviour (TPB) variables were measured using an adapted version of the validated Pearce, Rickwood, and Beaton (2003) TPB questionnaire. For measuring the variables of interest within the present study, items were adapted to reflect students’ beliefs about self-managing mental health.

Attitudes (7 items) were assessed using a 7-point likert scale, in which items ranged from Negative (i.e. 1 point) to Positive (i.e. 7

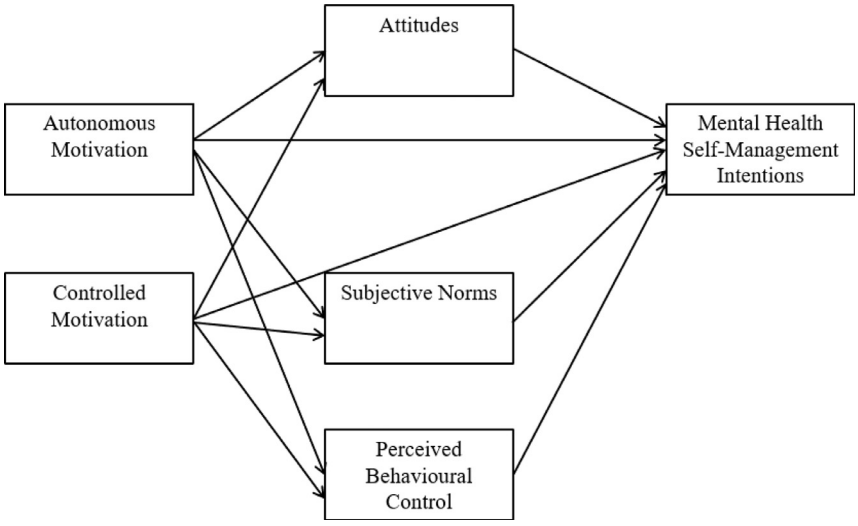

Figure 1. Integrated Behaviour Change (IBC) model detailing motivational and belief-based predictors of mental health self-management intentions.
*__Note:__ Hypothesis 1 (H1) refers to the paths between and autonomous and controlled motivation with attitudes, subjective norms and perceived behavioural control; Hypothesis 2 (H2) refers to the paths between autonomous and controlled motivation with mental health self-management intentions; Hypothesis 3 (H4) refers to the paths between attitudes, subjective norms and perceived behavioural control with mental health self-management intentions; Hypothesis 4 (H4) refers to the indirect relationship between autonomous and controlled motivation with mental health self-management intentions through attitudes, subjective norms and perceived behavioural control; covariance paths were applied between autonomous and controlled motivation, and between attitudes, norms and behavioural control; gender (male/female) and athlete status (athlete/non-athlete were included as statistical controls predicting all IBC variables in the model and are not listed for visual clarity.

points), with higher scores reflecting a more positive attitude. *Subjective norms* (4 items) were measured in relation to one's perceptions of approval from others (i.e. friends, family, other students and other important people) for self-managing mental health. Items were scored on a 7-point likert scale ranging from 'Definitely Disapprove' (i.e. 1 point) to Definitely Approve (i.e. 7 points) wherein higher scale scores indicated more approval from others. *Perceived behavioural control* (5 items) was assessed on a 7-point likert scale to determine students' perceived level of internal and external control to self-manage mental health. Higher scores indicated better levels of perceived behavioural control for mental health behaviours. Lastly, *intentions* (6 items) to self-manage mental health in the next four weeks was measured using a 7-point likert scale ranging from 'Strongly Disagree' to 'Strongly Agree'. Cronbach's alpha values for the TPB scales were as follows: 0.92 (attitudes), 0.87 (norms), 0.73 (behavioural control) and 0.94 (intentions).

2.3. Statistical methods and bias

2.3.1. Data management

Raw scores from the questionnaire were entered into Statistical Package for Social Sciences (SPSS version 22). Ten percent of the manually entered data was checked by a trained researcher to ensure consistency. Little's Missing Completely at Random (MCAR) test was conducted on each subscale to determine if the data was missing in random order. The MCAR test revealed the data was missing at random for each scale ($p \geq 05$), with between 1% and 3% of missing data found for each scale. As such, the Expectation Maximisation (EM) algorithm was conducted to estimate missing data on each scale, using intercorrelated items as predictors of the missing data (Field, 2013).

2.3.2. Data analyses

Mean scores and standard deviations were computed for each scale to provide an average which ranged between 0 and 7 on each IBCM factor. A series of independent samples T-Tests were performed to determine if there were significant differences between males and females, and athletes and non-athletes on each of the factors. Alpha significance was set to $p < 0.05$, and Cohen's d was calculated as a measure of effect size considering, effect sizes of 0.20, 0.50 and 0.80 as small, moderate and large, respectively (Field, 2013). SPSS Version 22 was used to analyse the T-Tests.

Given the sample size of 200, a full structural equation model was not decided upon for testing the study hypotheses, as there was not a sufficient ratio of subjects to model parameters to assume robustness in the model estimates (Schumacker & Lomax, 2004). Hence, a two-step approach for modelling was conducted using the maximum likelihood methodology, entailing: (i) examining the factorial validity of the constructs through Confirmatory Factor Analysis (CFA), and; (ii) treating the confirmed factors as observed variables within a structural path analysis model (Byrne, 2001). Goodness-of-fit indices recommended by Hu and Bentler (1999) were used to assess the fit of the CFA and path models. The Chi-Square (χ^2) value was reported with a non-significant χ^2 statistic indicating good model fit. However, this value was approached with caution given that large sample sizes tend to result in statistically significant Chi-Square values (Schumacker & Lomax, 2004). The comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA) were reported. CFI and TLI with values of ≥ 0.90, and RMSEA values of ≤ 0.08, considered as acceptable model fit.

For the CFA analyses, two separate models were specified. First, a two-factor motivation model was tested in which the four autonomous and four controlled items were regressed onto their respective factors (i.e. autonomous motivation and controlled motivation). Consistent with Ryan and Deci's (2000) conceptualisation of motivation, a covariance path was applied between the two factors. Second, a four factor TPB model was tested, specifying attitudes, subjective norms, perceived behavioural control and intentions as the four latent factors sharing covariance (Ajzen, 1991). A table was created detailing each of the goodness-of-fit indices, and factor-loading ranges within each model.

Results of the CFA were successful and the factors did not require any further modifications (reported below). To this end, the mean scale scores were treated as observed variables, and the covariance paths in the CFA models were re-specified in the path model to test the study hypotheses (H1, H2, H3, H4 and H5, see Fig. 1). For H4, indirect effects of autonomous motivation on mental health intentions through attitudes, subjective norms and perceived behavioural control were assessed. As statistical controls, Gender (males = 0, females = 1) and athlete status (non-athlete = 0, athlete = 1) were coded as dichotomous variables and regressed onto each of the IBCM factors. A figure was produced specifying beta (β) coefficient values for each direct path, and a R^2 value related to the proportion of total variance predicted for mental health self-management intentions. In both the CFA and path analysis models, Bollen–Stine bootstrapping was conducted with 5000 samples to improve the accuracy of parameter estimates and fit indices (Byrne, 2001). AMOS Version 21 was used to analyse the CFA and path models. In the interests of open science (McKiernan et al., 2016), we included outputs from the AMOS software as a supplementary source.

3. Results

3.1. Preliminary Analysis

Two hundred participants consented and completed the questionnaire. The mean age of the sample was 21.10 years (SD = 3.73); 53% were male and 69% were athletes. Table 1 presents the descriptive statistics regarding scale means, categorised by gender and athlete status. The only significant difference found between genders was for self-management intentions to the extent that females ($M = 5.24$; SD: 0.94) scored higher than males (M: 4.85: SD: 1.26) yielding a small-to-moderate effect size ($d = 0.34$; $t\,(198) = 2.43$, $p < 0.01$). No significant differences were found for athlete status.

3.2. Main results

The fit indices and factor loadings for CFA models are detailed in Table 2. All factor correlations were positive and statistically significant ($p < 0.05$). For both the SDT and TPB CFA models, the goodness-of-fit indices were all above the recommended cut-off points outlined by Hu and Bentler (1999), justifying the specification of the path model to

Table 1
Mean scores and standard deviations for sample, gender, and athlete status for each of the IBC framework scales.

	Autonomous motivation	Controlled motivation	Attitudes	Subjective Norms	Perceived Behavioural Control	Intentions
Sample	5.37 (1.14)	3.75 (1.19)	5.68 (1.06)	5.88 (0.90)	5.01 (0.80)	5.04 (1.13)
Male	5.27 (1.14)	3.65 (1.18)	5.67 (1.05)	5.78 (0.85)	5.03 (0.82)	4.84 (1.26)
Female	5.48 (1.13)	3.86 (1.20)	5.68 (1.07)	5.99 (0.94)	4.98 (0.78)	5.24* (0.94)
Athlete	5.36 (1.10)	3.72 (1.19)	5.63 (1.11)	5.90 (0.86)	5.08 (0.83)	5.09 (1.12)
Non-Athlete	5.38 (1.23)	3.83 (1.19)	5.78 (0.92)	5.82 (0.98)	4.86 (0.72)	4.91 (1.15)

Note: all scale items were scored on 7-point likert scales; standard deviations are presented in brackets beside scale means;
* = $p < 0.05$ as measured by the independent samples t-test:

Table 2
Summary of Fit Indices and Factor Loadings for the CFA and Path Model.

CFA Models	*df*	χ^2	CFI	TLI	RMSEA	Factor Loadings	Covariance values
Two factor motivation	19	40.242 $p < .01$	.962	.944	0.075 (95% CI's = 0.042 to 0.107)	**AM**: 0.76, 0.67, 0.86, 0.82. **CM**: 0.70, 0.49, 0.75, 0.50.	**AM ↔ CM** = 0.32
Theory of Planned Behaviour	224	503.347, $p < 0.001$	.913	.901	0.079 (95% CI = 0.065 to.084)	**AT**: 0.54, 0.66, 0.83, 0.88, 0.80, 0.80, 0.84 **SN**: 0.86, 0.77, 0.69, 0.89. **BC**: 0.66, 0.75, 0.75, 0.78, 0.65. **IN**: 0.85, 0.86, 0.85, 0.91, 0.95, 0.76.	**AT ↔ SN** = 0.34; **AT ↔ PBC** = 0.29; **AT ↔ IN** = 0.38. **SN ↔ PBC** = 0.32; **SN ↔ IN** = 0.34. **PBC ↔ IN** = 0.24.
Path Model							
IBC model	6	14.085 $p > 0.05$	0.969	0.893	0.062 (95% CI = 0.000 to 0.114)	n/a	AM ↔ CM = 0.33; AT ↔ SN = 0.35; AT ↔ PBC = 0.18; SN ↔ PBC = 0.28.

*__Note:__ AM = Autonomous motivation; CM = controlled motivation; AT = Attitudes; PBC = Percieved Behavioural Control; IN = Intentions.

test the study hypotheses.

Estimation of the path model revealed an acceptable fit to the data in relation to the cut-off points outlined by Hu and Bentler (1999). The χ^2 statistic was not significant ($p > 0.05$), both the RMSEA (0.062) and CFI (0.969) displayed satisfactory fit indices, whilst the TLI value (0.893) was close to the recommended value of 0.90. Table 2 details specific covariance values between the factors, and fit indices for the path model.

In view of the study hypotheses tested (see Fig. 2), H1 was supported as autonomous motivation directly and positively predicted all TPB variables, with the standardised β values ranging from 0.40 (attitudes, $p < 0.001$), 0.33 (subjective norms, $p < 0.001$) to 0.15 (perceived behavioural control, $p < 0.05$). In contrast, controlled motivation did not exert a significant influence on any TPB variables. Support was also found for H2, as autonomous motivation directly and positively predicted mental health self-management intentions ($\beta = 0.29$, $p < 0.001$). In a lack of accordance with the study hypotheses, controlled motivation also exerted a significant positive (albeit smaller than autonomous) influence on mental health self-management intentions ($\beta = 0.13$, $p < 0.05$). Of the three TPB variables predicting self-management intentions, only perceived behavioural control exerted a statistically significant positive effect ($\beta = 0.12$, $p < 0.05$). When testing the effect of autonomous motivation and controlled motivation on self-management intentions through the TPB variables (H4), no statistically significant indirect effects were present in the path model.

With regards to the control variables, females displayed higher scores than males on just one factor within the model, namely, mental health self-management intentions ($\beta = 0.14$, $p < 0.05$). The second control variable, athlete status, did not exert a significant effect on any variables. Overall, the model predicted a significant proportion of variance for mental health self-management intentions ($R^2 = 0.30$).

4. Discussion

4.1. Key results and interpretation

Self-management interventions may offer the opportunity to empower the student population with skills to manage life stressors and mild symptoms, right through to preventing mental illness and promoting well-being (Wolf, 1996). The aim of the current study was to test predictors of mental health self-management intentions in student-athletes and non-athletes using components of the IBCM framework (Hagger & Chatzarantis, 2009a; 2014). The structural validity of the IBCM was supported through CFA, and IBCM variables made a significant contribution to the variance explained ($R^2 = 0.30$) for self-management intentions, with some support found for the study hypotheses. Consistent with the IBCM (Hagger & Chatzarantis, 2014) autonomous motivation directly predicted adaptive mental health attitudes, subjective norms and perceived behavioural control (H1), and self-management intentions (H2). However, unexpectedly perceived behavioural control was the only TPB construct to predict intentions (H3), and the autonomous motivation-intention relationship was not mediated by TPB variables (H4). We now discuss the findings and provide theoretically-informed recommendations for those seeking to design and implement self-management mental health interventions with students.

Sixty nine percent of the sample were athletes, and athlete status (i.e. athlete or non-athlete), did not exert a significant influence on self-management intentions. Whilst self-management encapsulates a broader range of strategies than accessing professional mental health services (e.g. speaking to others, relaxation), our findings are similar to recent studies reporting likewise intentions to utilise mental health services among student-athlete and non-athletes (Brown, Hainline, Kroshus & Wilfert, 2014; Barnard, 2016). Earlier studies (Watson, 2005) did report a higher mental health service willingness in non-athletes in comparison to student-athletes, however recent

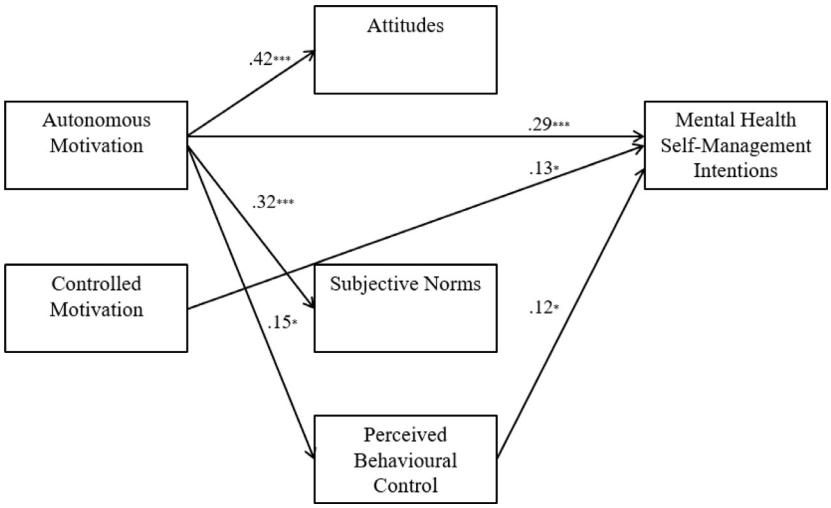

Figure 2. Results of IBC detailing predictors of self-management intentions

***Note:** Hypothesis 1 (H1) was supported to the extent that autonomous motivation positively predicted attitudes, subjective norms and perceived behavioural control; Hypothesis 2 (H2) refers to statistically significant positive relationships between autonomous and controlled motivation with mental health self-management intentions; Hypothesis 3 (H4) refers to significant path between perceived behavioural control with mental health self-management intentions; Hypothesis 4 (H4) was not supported; covariance paths were applied between autonomous and controlled motivation, and between attitudes, norms and behavioural control; gender (male/female) and athlete status (athlete/non-athlete) were included as statistical controls predicting all IBC variables in the mode, but were not included for visual clarity.

improvements in athlete help-seeking perceptions have been likely facilitated through campaigns (Liddle, Deane & Vella, 2017) and interventions about mental health that are championed by prominent athletes and leaders (Barnard, 2016; Kern et al., 2017).

Lopez and Levy (2013) reported a strong student-athlete preference for psychotherapists that have familiarity with sports. As such, adopting an optimisation style of mental health provision may be warranted for student-athletes in which practitioners are attune to their needs, including their co-existing academic and sporting demands, and adoption of high performance sporting norms (Donohue, Pitts, Gavrilova, Ayarza, & Cintron, 2013). By tailoring interventions around such recommendations, mental health interventions will be more fitting for the student-athlete population (Goodheart et al., 2006). Therefore, we propose that universities may consider employing and/or training service providers in sporting norms, alongside accounting for other factors discussed in the present study, such as gender.

Females reported significantly better intentions than males to self-manage their mental health (H5), which replicates current studies among the general population (Clement et al., 2015; McLafferty et al., 2017; Thorley, 2017). Females and males, both non-athletes (Clement et al., 2015) and athletes (Breslin et al., 2017), are differently attentive to particular mental health messages. Therefore, in keeping with our proposals for better engagement with student-athletes, the use of gender-relatable mental health advocates may also help improve mental health self-management in students (Storrie, Ahern & Tucket, 2010; Lopez & Levy, 2013). Beyond the demographic findings, the sequences from the IBCM framework highlighted significant psychosocial factors that may be considered.

CFA confirmed acceptable factorial validity for both SDT and TPB constructs, alongside acceptable model fit indices when integrated into a path analysis model. Contrary to our hypotheses, we noted a positive (albeit small) effect for controlled motivation on self-management intentions. This finding may be explained by students wanting to demonstrate self-management behaviours to satisfy external agents (e.g. close family member, teammate, coach), which from an adaptive point of view, may be because the individual perceives them to be acting within their best interests (Iyengar & Lepper, 1999). Whilst not disregarding the value of such relationships, and more aligned to sustainable motives in SDT hypotheses, the larger effect exerted by autonomous motivation on self-management intentions (H2) suggests that autonomous (rather than external) forms of motivation should be promoted in order to facilitate more effective and sustainable mental health self-management among students (Hagger & Chatzarantis, 2014; Ryan & Deci, 2017). Promoting autonomous motivation also complements the aforesaid optimisation, and strengths-based approach for the student-athlete population (Donohue et al., 2016).

Autonomous motivation can be achieved when those involved in shaping the social environment (e.g. service providers, coaches) offer psychological needs-support (i.e. competence, autonomy and social relatedness) through helping individuals explore barriers, and develop personally-valued pathways to wellness (Ryan, Patrick, Deci & Williams, 2008). Indeed, increased needs-support from intervention deliverers has been shown to increase autonomous motivation for a range of health behaviours, and needs satisfaction exerts unique direct effects on mental and physical health (Ng et al., 2012; Teixeira et al., 2012). As the present study did not encompass needs support measures, we recommend the inclusion of needs-support and satisfaction components in further IBCM studies to improve the prediction of mental health self-management (see Hagger, Chatzisarantis, & Harris, 2006 model for a guide). Such research may help clarify the interpersonal significance of those involved in delivering mental health awareness programmes to students, and guidance can be provided on how best to satisfy the needs of the student population, which may augment positive change, and promote well-being (Ryan & Deci, 2017).

Replicating meta-analytic findings testing the IBCM model for health behaviours (Hagger & Chatzarantis, 2009a), our study showed that autonomous motivation exerted statistically significant positive effects on the three TPB variables of perceived behavioural control, attitudes and subjective norms (H1). This finding suggests that cognitive beliefs about the utility of self-managing mental health can be facilitated more effectively when one has autonomously identified and internalised the importance of self-management. Surprisingly, perceived behavioural control was the only TPB variable to exert an effect on intentions (H3). This finding is in contrast to research (Hagger et al., 2017) testing the IBCM for sugar consumption in which perceived behavioural control was the only TPB variable to not directly predict intentions. Given the positive relationship between perceived behavioural control and intentions in the present study, we suggest that those involved in delivering mental health awareness messages to students promote fewer barriers for self-management, and greater internal control (Bohon et al., 2016; Schomerus et al., 2009), which again may be complemented in the student-athlete population by the aforesaid optimisation approach (Donohue et al., 2013).

Also unexpectedly, all three TPB variables did not mediate the autonomous motivation-intention relationship. Our findings suggest that students are more likely to engage with self-management directly through autonomous motivation, rather than indirectly through belief-based TPB constructs. For example, when students have internalised the importance of self-management, they may not have to deliberatively consider the perceived benefits (i.e. attitudes), barriers (i.e. perceived behavioural control), or others (i.e. subjective norms) perceptions to enact the required intention for change. Whilst this finding refutes

meta-analytic findings of the IBCM model on physical activity (Hagger & Chatzarantis, 2009a), and research testing the IBCM for sugar consumption intentions (Hagger et al., 2017), the present study is the first to assess the IBCM research for mental health self-management intentions, which when enacted, may be less related to beliefs in comparison to motivation.

To conclude, the structural and predictive validity of the IBCM model was supported, and contributed to current understanding of the psychosocial factors that are salient for mental health self-management promotion among student-athletes and non-athletes. Our data leads us to suggest that autonomous motives and enhanced behavioural control may facilitate better intentions for mental health self-management. Therefore, practitioners may consider promoting autonomous motives through the IBCM, reflective of social environments that are conducive to psychological needs-support and greater internal control. To meet the needs of students, universities may also consider tailoring interventions to athlete norms, wherein practitioners are attune to the sporting environment, and adopt a strengths-based, optimisation approach. The use of gender-relatable role models may also increase programme efficacy. Further research may assess the efficacy of such recommendations through a controlled research design that encompasses additional needs-support and satisfaction measures.

4.2. Generalisability and limitations

Whilst the present study explained a significant proportion of variance for mental health self-management intentions, we exclusively focused on students' mental health, and as such, the IBCM model findings may not extrapolate to other populations (e.g. older adults, younger children). Further work testing the IBCM model may consider adhering to psychometric validity recommendations in order to ensure robust assumptions within that population (Hagger & Chatzarantis, 2009a). In view of limitations, the present study was conducted using a cross-sectional design, and therefore we could not infer causality from the data. Studies adopting a longitudinal controlled design are needed to advance research on self-management. Moreover, athlete status was defined loosely and did not include information on the level of participation (i.e. elite, sub-elite, non-elite and recreational), and therefore future studies may consider developing a screening tool for better classification of athletic samples. While the use of CFA was advantageous for assessing factorial validity, other validity methods such as test-retest reliability and concurrent validity were not included in the present study, and may therefore be considered for future validation studies assessing the IBCM in the mental health domain (Hagger & Chatzisarantis, 2009a). Finally, the model tested did not assess further IBCM variables such as needs-support, and implicit constructs, leaving gaps in our current theoretical understanding of students' mental health self-management. To address such limitations ongoing research in our institute will assess the IBCM with validated needs-support/satisfaction measures.

Declaration of interest

All authors confirm that we have no conflict of interest to declare.

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Supplementary materials

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